

TEKNIK PENULISAN ILMIAH

SCIENTIFIC WRITING TECHNIQUES

**FORMAT-FORMAT LAPORAN
BATASAN PERSOALAN**

FORMAT PERANCANGAN

PENELITIAN	PERANCANGAN
persoalan	fakta - data
kajian pustaka	persoalan desain
tujuan	tujuan
pengumpulan data	kriteria
analisis data	penyusunan konsep
interpretasi - laporan	presentasi

Creswell. J.W (2011)

Donna P. Duerk (1993).

FORMAT PERANCANGAN

Bab Kajian Pendekatan Perancangan

Kajian Formal, Tipologi Fungsi, Preseden dll.

Kajian Lokasi

Metode Paerancangan

fakta
- data

persoalan
desain

tujuan

kriteria

penyusunan
konsep

presentasi

Bab Pendahuluan

Batasan Perancangan

Problematika

Tujuan

Bab Konsep dan Rancangan

Rumusan konsep, konsep figuratif

Rumusan deskripsi rancangan
Gambar-gambar rancangan


Dimodifikasi dari Donna P. Duerk (1993)

FORMAT PENELITIAN

SUSUNAN PENULISAN LAPORAN PENELITIAN KUANTITATIF

SUSUNAN	METODE ILMIAH
1. PENDAHULUAN Latar belakang, Masalah penelitian, Keterbatasan, Definisi istilah.	Identifikasi Masalah
2. LANDASAN TEORI Tinjauan pustaka, Tinjauan studi, Kerangka konsep, Hipotesis	Perumusan hipotesis
3. METODOLOGI Metode penelitian, Sampling, Metode pengumpulan data, Instrumen, Teknik analisis data	Prosedur pengujian hipotesis
4. ANALISIS DAN INTERPRETASI	
5. KESIMPULAN DAN SARAN Kesimpulan, Saran	Kesimpulan dan Saran dari peneliti

SUSUNAN PENULISAN LAPORAN PENELITIAN KUALITATIF

SUSUNAN	METODE ILMIAH
1. PENDAHULUAN Latar belakang, Masalah penelitian, Hipotesis, Keterbatasan, Definisi istilah, Kerangka penelitian	Identifikasi Masalah dan perumusan hipotesis
2. OBJEK PENELITIAN	
3. PROSEDUR Jenis penelitian, peran peneliti, Metode pengumpulan data, Prosedur analisis data, Metode verifikasi data	
4. HASIL PENELITIAN DAN HUBUNGANNYA DENGAN TEORI DAN LITERATUR	
5. KESIMPULAN DAN SARAN Kesimpulan, Saran	Kesimpulan dan Saran dari peneliti

Struktur Tulisan Penelitian

IDENTIFIKASI MASALAH		PERUMUSAN HIPOTESIS		PENGUJIAN HIPOTESIS		BUAT KESIMPULAN
Memahami sumber masalah	Merumuskan masalah penelitian	Membuat kerangka konsep	Merumuskan hipotesis	Mendisain penelitian	Mengumpulkan data dan analisis	Membuat kesimpulan

PENELITIAN KUANTITATIF

BAB 1 PENDAHULUAN	BAB 2 LANDASAN TEORI	BAB 3 METODOLOGI	BAB 4 ANALISIS DAN INTERPRETASI	BAB 5 KESIMPULAN DAN SARAN
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PENELITIAN KUALITATIF

BAB 1 PENDAHULUAN	BAB 2: OBJEK PENELITIAN BAB 3: DATA DAN INTERPRETASI BAB 4. DISKUSI	BAB 5 KESIMPULAN DAN SARAN
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Christopher Frayling, 1993 'Research into Art and Design'

Design research can be categorized in three ways:

research 'for' design is that concerned with applications, for example into materials and energy, and with the application of knowledge from other disciplines such as environmental psychology, ecology or sociology;

research 'into' design might include investigations into histories and theories of architecture, landscape architecture or spatial planning, or into design methods;

research 'through' design describes work where the procedure of design itself constitutes the methodology through which knowledge or insights are obtained. It is this third area of research 'through' design that has been contentious.

FORMAT PERANCANGAN

research 'for' design

concerned with applications, for example into materials and energy, and with the application of knowledge from other disciplines such as environmental psychology, ecology or sociology

Penyajian dan evaluasinya

fakta
- data

persoalan
desain

tujuan

kriteria

penyusunan
konsep

presentasi

Menyusun batasan persoalan

research 'into' design investigations into histories and theories of architecture, landscape architecture or spatial planning, or into design methods

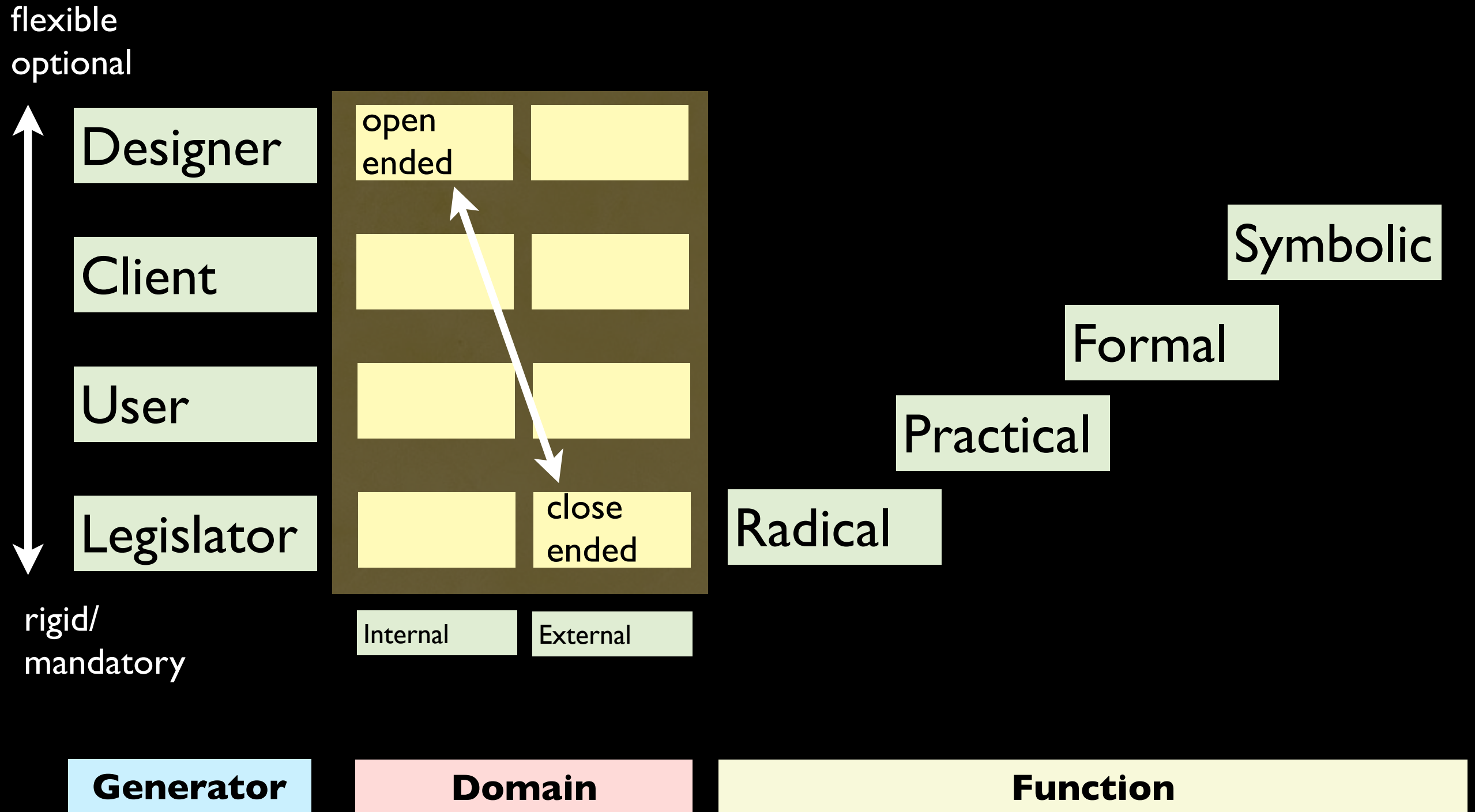
Dimodifikasi dari Donna P. Duerk (1993)

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Menyusun Batasan Persoalan Perancangan

1. Space of Design Constraint
2. Matrix of Inquiry

Space of Design Constraints – Brian Lawson



Space of Design Constraints – Brian Lawson

The generators of constraints

- designers themselves
- clients
- users
- legislators

designer-generated constraints are the most flexible; legislator-generated constraints are the least flexible.

Space of Design Constraints – Brian Lawson

The domain of constraints

- internal to the thing being designed
- imposed from outside (external)

Space of Design Constraints – Brian Lawson

The type of constraint

Symbolic: related to meaning

Formal: color, texture, shape, etc.

Practical: related to production

Radical: fundamental, related to the main purpose

“The Matrix of Inquiry” – Richard Buchanan

Nature of Inquiry

kind of question

Theory

principles + causes of design

Practice

design practice

Production

making products

Past

Present

Scope of Inquiry

scale of investigation

Future

theory

Clinical

the single case

Applied

issue common
to a family of
causes

Basic

fundamental
issue common
to all cases

Direction of Inquiry

orientation of time

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“The Matrix of Inquiry” – Richard Buchanan

Horizontal (x) axis

‘scope of inquiry’ dimension, ‘clinical’ means refers to work primarily based on case studies.

Vertical (y) axis

what drives a particular inquiry—from the immediate needs of production, through questions of (design) practice out to questions generated by theory.

Depth (z) axis

past, present, and future as the ‘direction’ of inquiry

PERSOALAN DISAIN

DESIGN PROBLEMS

PERSOALAN DESAIN

PROBLEMS

Tame problem: Tame problems may be quite complex, but they lend themselves to analysis and solution by known techniques. A traditional linear process is sufficient to produce a workable solution to a tame problem in an acceptable period of time, and it is clear when a solution has been reached.

A wicked problem defies any standard attempt to find a solution because it is a symptom or result of multiple, contingent, and conflicting issues. Environmental degradation, social and economic inequity, and terrorism are some of the classic wicked problems that we face in the twenty-first century.

Rittel, H., and M. M. Webber. 1973. Dilemmas in a general theory of planning. *Policy Sciences* 4:155–69.

Rittel, W.J. and Webber, M.M. (1973) Planning Problems are Wicked Problems, In Cross, N. *Developments in Design Methodology*, Chichester: Wiley.

WICKED PROBLEM

(1) There is no definitive formulation of a wicked problem. Formulating the problem and the solution are essentially the same thing. Each attempt at creating a solution changes the understanding of the problem.

(2) Wicked problems have no stopping rule. Since you cannot define the problem, it is difficult to tell when it is resolved. The problem solving process ends when resources are depleted, stakeholders lose interest or political realities change.

(3) Solutions to wicked problems are not true-or-false but good-or-bad.

Since there are no unambiguous criteria for deciding if the problem is resolved, getting all stakeholders to agree that a resolution is 'good enough' can be a challenge.

WICKED PROBLEM

(4) There is no immediate and no ultimate test of a solution to a wicked problem.

Solutions to wicked problems generate waves of consequences, and it is impossible to know how all of the consequences will eventually play out.

(5) Every implemented solution to a wicked problem has consequences. Once the web site is published or the new customer service package goes live, you can't take back what was on-line or revert to the former customer database.

(6) Wicked problems do not have a well-described set of potential solutions.

Various stakeholders will have differing views of acceptable solutions. It is a matter of judgment as to when enough potential solutions have emerged and which should be pursued.

WICKED PROBLEM

(7) Every wicked problem is essentially unique.

There are no 'classes' of solutions that can be applied to a specific case. "Part of the art of dealing with wicked problems is the art of not knowing too early what type of solution to apply." I

(8) Every wicked problem can be considered a symptom of another problem.

A wicked problem is a set of interlocking issues and constraints which change over time, embedded in a dynamic social context.

(9) The causes of a wicked problem can be explained in numerous ways.

There are many stakeholders who will have various and changing ideas about what might be a problem, what might be causing it, and how to resolve it.

(10) The planner (designer) has no right to be wrong.

A scientist is expected to formulate hypothesis, which may or may not be supportable by evidence. A designer doesn't have such a luxury, they are expected to get things right.

ILL-DEFINED PROBLEMS

1. There is no definitive formulation of the problem. When the problem is initially set, the goals are usually vague, and many constraints and criteria are unknown. The problem context is often complex and messy, and poorly understood. In the course of problem-solving, temporary formulations of the problem may be fixed, but these are unstable and can change as more information becomes available.

2. Any problem formulation may embody inconsistencies. The problem is unlikely to be internally consistent; many conflicts and inconsistencies have to be resolved in the solution. Often, inconsistencies emerge only in the process of problem-solving.

ILL-DEFINED PROBLEMS

3. Formulations of the problem are solution-dependent. Ways of formulating the problem are dependent upon ways of solving it; it is difficult to formulate a problem statement without implicitly or explicitly referring to a solution concept. The way the solution is conceived influences the way the problem is conceived.

4. Proposing solutions is a means of understanding the problem. Many assumptions about the problem and specific areas of uncertainty can be exposed only by proposing solution concepts. Many constraints and criteria emerge as a result of evaluating solution proposals.

5. There is no definitive solution to the problem. Different solutions can be equally valid responses to the initial problem. There is no objective true-or-false evaluation of a solution; but solutions are assessed as good or bad, appropriate or inappropriate.

Nigel Cross (2008) Engineering Design Methods, John Wiley&Sons, 4th edition hal. 13-4

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PENDEKATAN TERHADAP PERSOALAN DESAIN

DESIGN THINKING

The “black box” approach concerns the creativity and mystery of design. It sees design as an abstract process that occurs in the mind of any given designer. As such, design cannot be analyzed, but techniques such as brainstorming and the application of synetics are helpful in visualizing the design process.

The “glass box” approach analyzes design based on its logical process and decision sequence. The design process is a sequence of events, which includes identification, analysis, synthesis, and evaluation.

PERSOALAN DESAIN

DESIGN PROBLEMS

- ▶ Tak dapat dinyatakan secara komprehensif.
- ▶ Sering dipenuhi ketidakpastian, tujuan dan prioritas adalah relatif.
- ▶ Masalah disain tidak statis!
- ▶ Memerlukan penafsiran subjektif. Tidak ada formulasi masalah disain yang sepenuhnya objektif.
- ▶ Cenderung diorganisir secara hierarkhis.
- ▶ Tidak ada cara yang objektif atau logis dalam menentukan level yang tepat di mana kita akan menangani masalah disain.
- ▶ Setiap keputusan biasanya bersifat pragmatis (tergantung waktu, biaya dan sumber daya yang tersedia bagi disainer).

SOLUSI DESAIN

DESIGN SOLUTIONS

- ▶ Tak dapat dibatasi jumlahnya!
- ▶ Tidak ada solusi optimal atas masalah disain. Selalu merupakan kompromi
- ▶ Tidak ada metoda pengukuran yang kukuh untuk mengevaluasi disain
- ▶ Solusi disain tak akan pernah sempurna, lebih mudah dikritik ketimbang menciptakannya

PROSES DESAIN

DESIGN PROCESS

- ▶ Proses yang tidak akan pernah berakhir!
- ▶ Tidak ada proses yang tepat dan bebas kesalahan.
- ▶ Proses melibatkan penemuan sekaligus pemecahan masalah.
- ▶ Solusi dan masalah bukan proses yang linier tetapi bersifat argumentatif.
- ▶ Penemuan masalah dan solusi bukan sebuah kegiatan yang didominasi oleh logika namun melibatkan pemikiran kreatif di level yang tinggi.
- ▶ Pasti melibatkan penilaian mutu yang subjektif!
- ▶ Sains mendiskripsikan, disain adalah anjuran.

PROSES DESAIN

DESIGN PROCESS

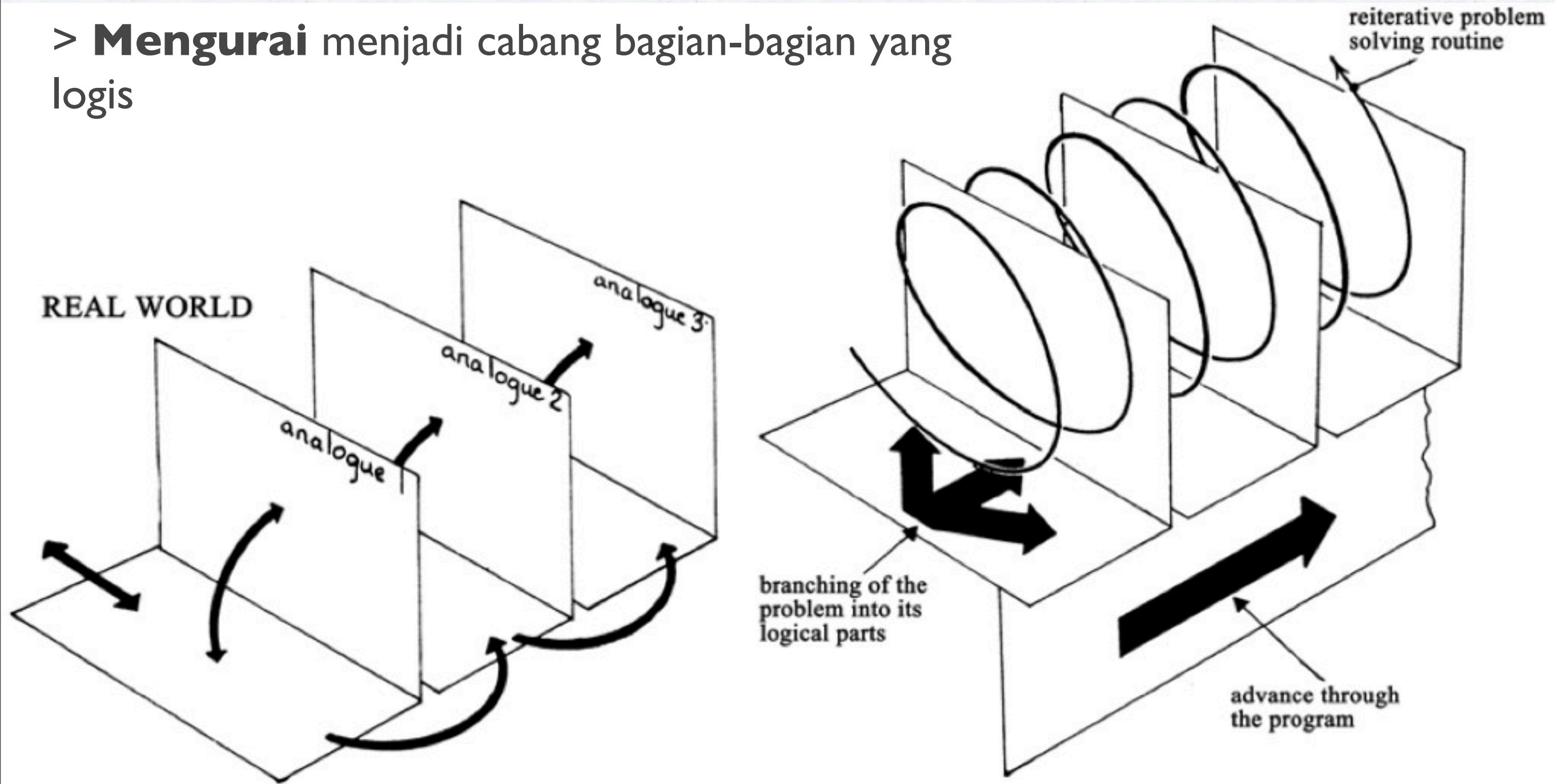
- ▶ Sains: menangani masalah apa yang ada, mencari tahu bagaimana dan mengapa. Disain menangani masalah yang mungkin, dapat dan seharusnya.
- ▶ Sains meramalkan masa depan, disain mereseapkan dan menciptakan masa depan.
- ▶ Disainer bekerja dalam konteks perlunya tindakan yaitu mengubah lingkungan.
- ▶ Seniman bebas berfokus pada isu yang menarik, disainer tidak tidak bisa bebas!
- ▶ Ilmuwan dapat berbuat salah dan dapat saja tetap memajukan sains. Disainer sulit diakui adanya kontribusi dari sebuah disain yang salah!

MENSTRUKTURKAN PERSOALAN DISAIN

STRUCTURING DESIGN PROBLEM

MENSTRUKTURKAN PERSOALAN DESAIN

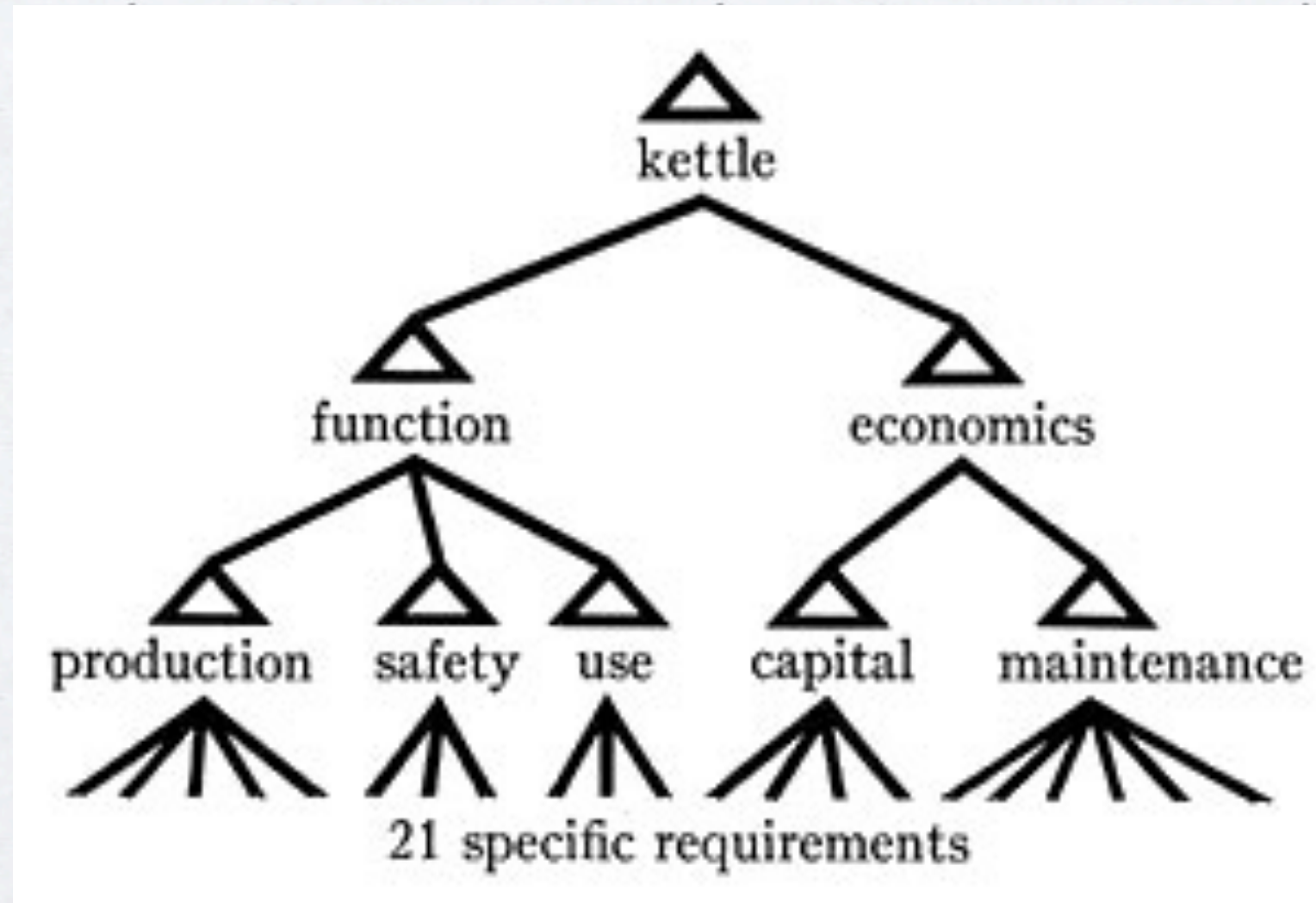
> **Mengurai** menjadi cabang bagian-bagian yang logis



Design process, branching (Archer, 1969, p.94 and p.100)

MENSTRUKTURKAN PERSOALAN DESAIN

> **Mengurai** (*decompose*) menjadi bagian-bagian yang sepenuhnya independen



Design is the process of inventing things which display new physical order, organization, form, in response to function...

Christopher Alexander, 1964 *Notes on the Synthesis Of Form*

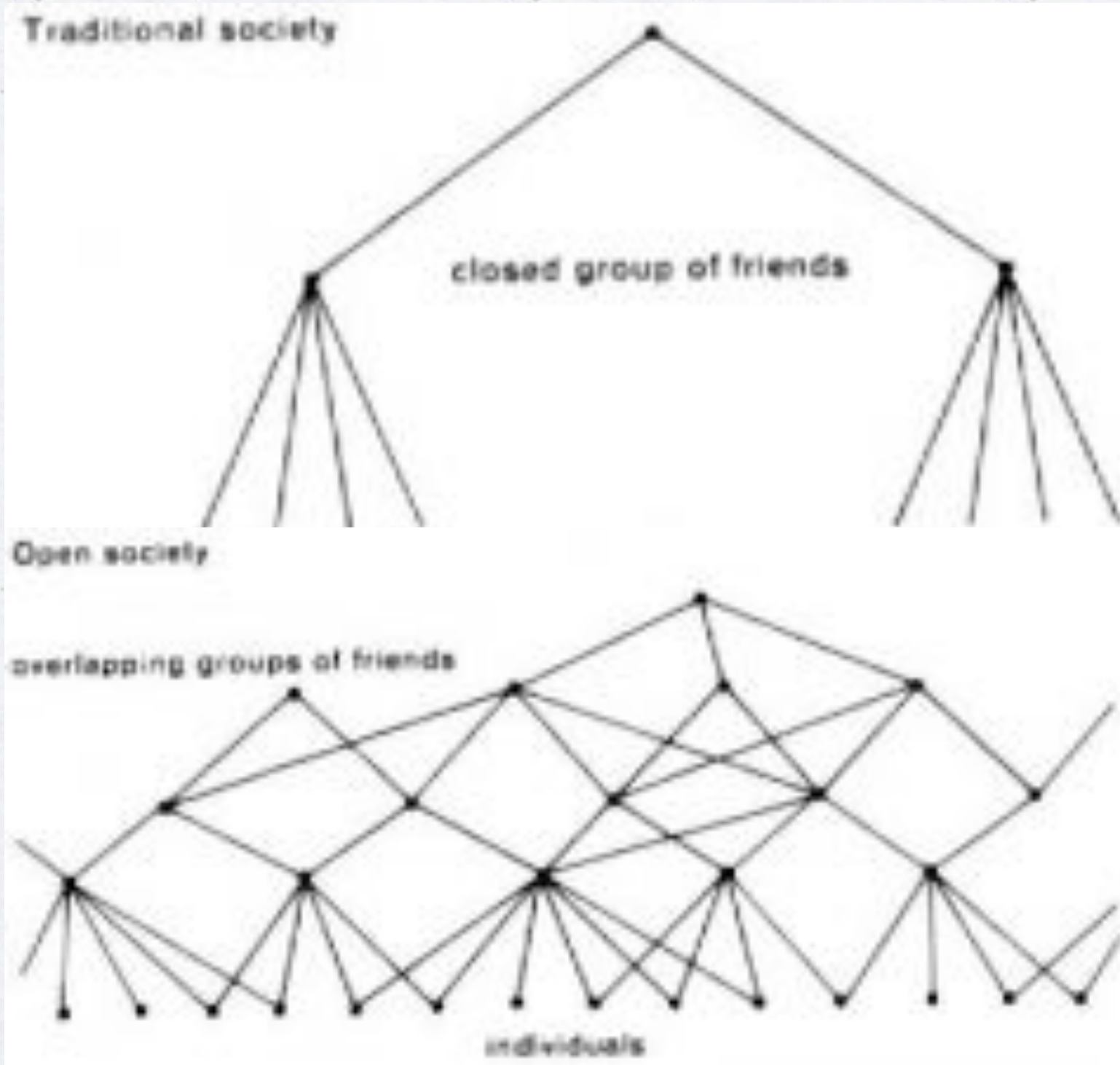
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MENSTRUKTURKAN PERSOALAN DESAIN



Christopher Alexander, 1964 *Notes on the Synthesis Of Form*

MENSTRUKTURKAN PERSOALAN DESAIN



> **Mengurai** menjadi bagian-bagian yang logis namun tetap memperhatikan kaitan antar satu dengan lainnya - tidak independen - namun kompleks: sebuah struktur yang *lattice*

Christopher Alexander, 1966, *A City is not a Tree*

Architectural Forum, Vol 122, No 1, April 1965, pp 58-62 (Part I),

Vol 122, No 2, May 1965, pp 58-62 (Part II)

Design, No 206, February 1966, pp46-55

Ekistics, Vol 23, pp 344 - 348, June 1967

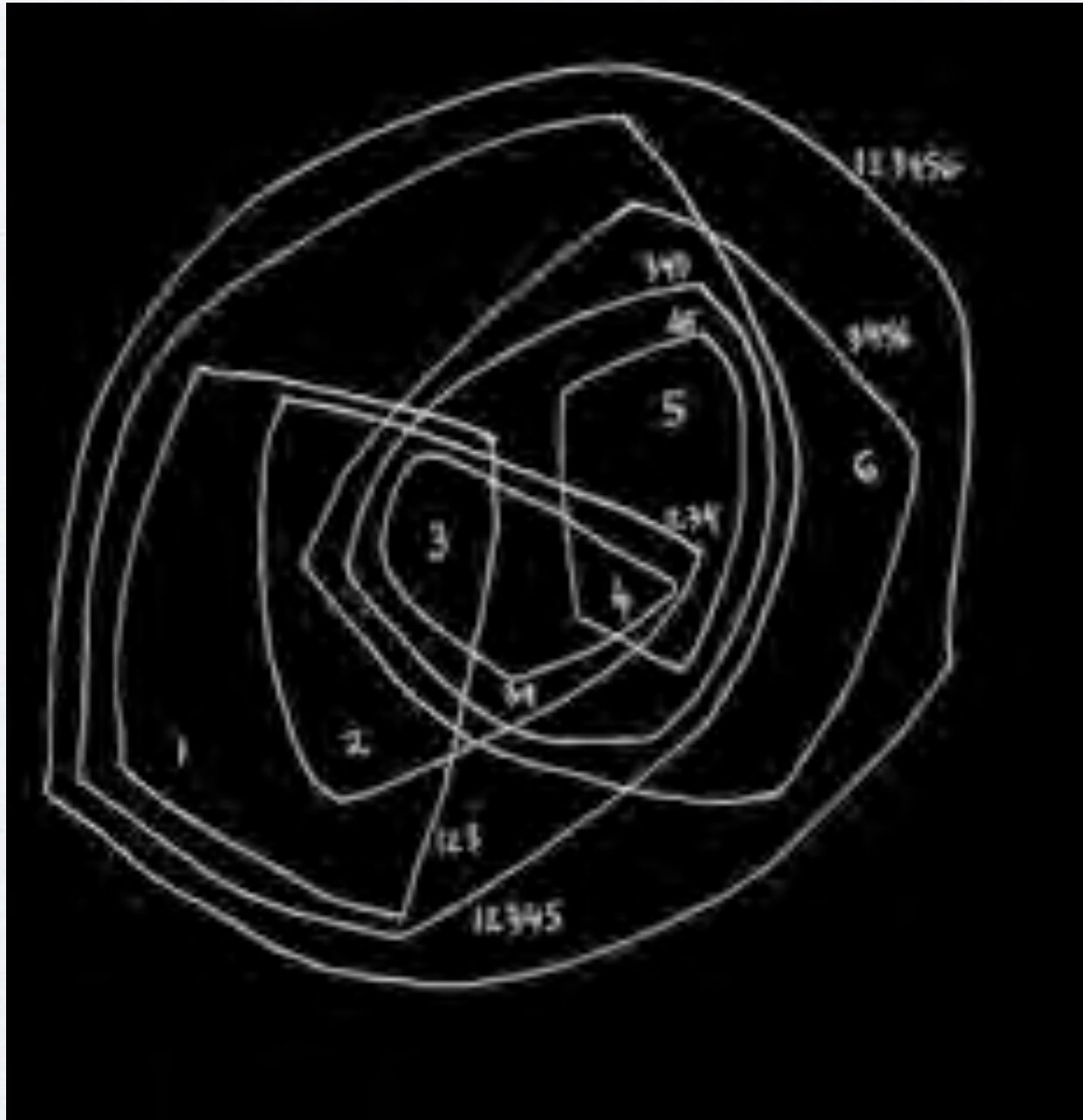
Bell, G & Tyrwhitt, J(eds) *Human Identity in the Urban Environment*, Harmondsworth, UK, Penguin Books, 1972

Thackara, J. (ed.) (1988), *Design After Modernism: Beyond the Object*, Thames and Hudson, London, pp. 67-84.

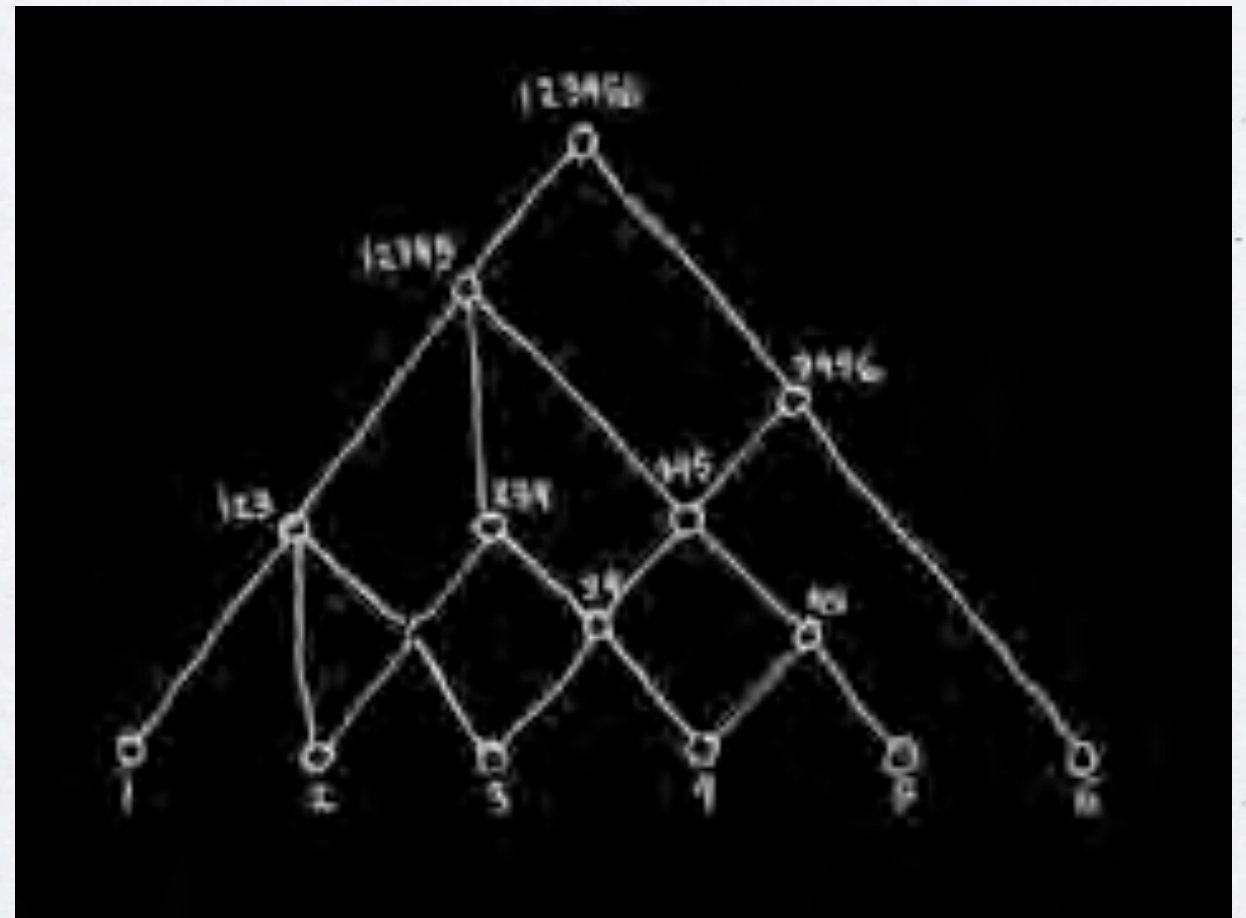
<http://www.rudi.net/books/201>

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MENSTRUKTURKAN PROSOALAN DESAIN



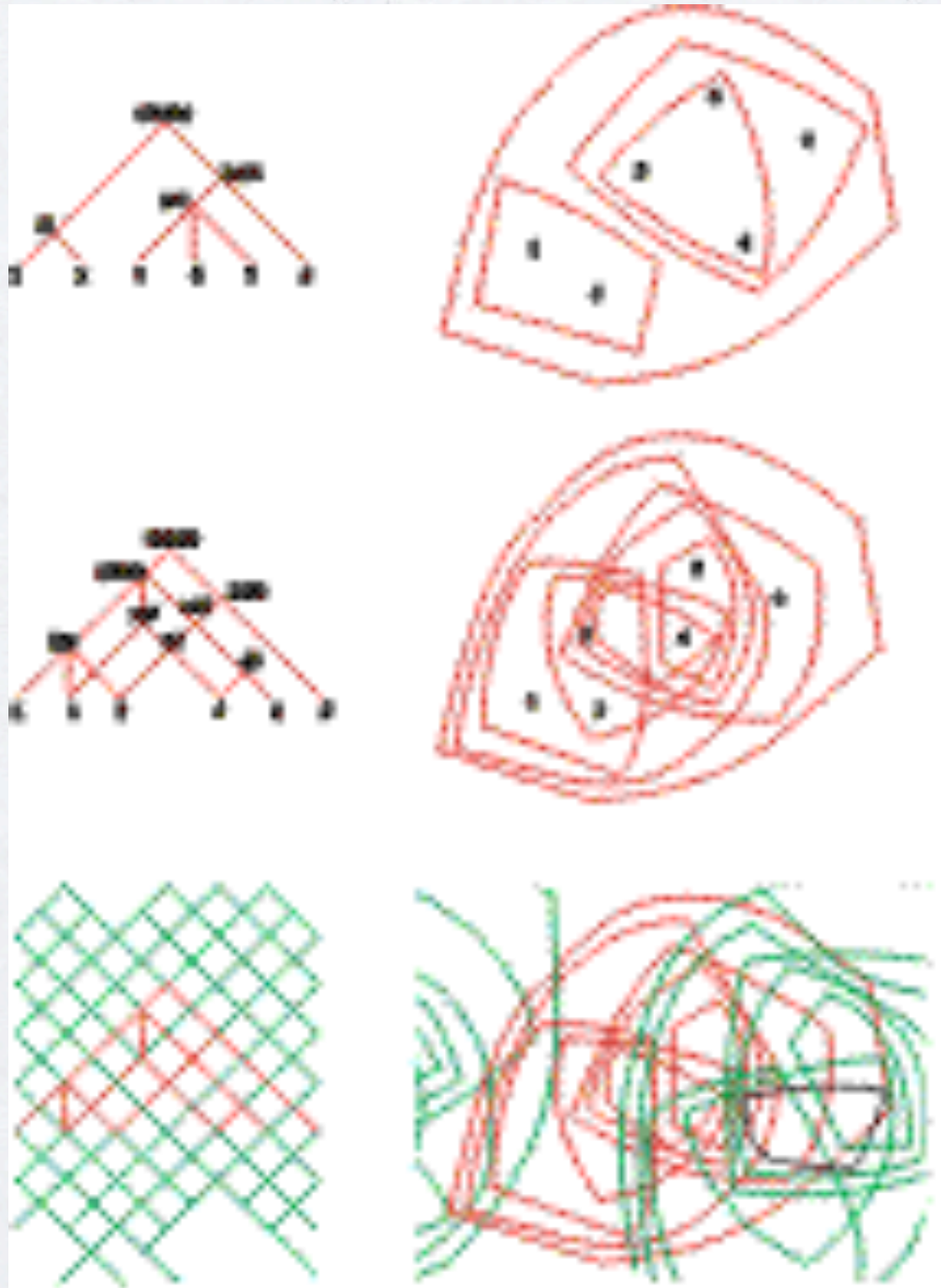
Christopher Alexander, *City is not a Tree*



<http://www.rudi.net/pages/8755>

MENSTRUKTURKAN PERSOALAN DESAIN

**Christopher Alexander,
1977, Pattern Language**



<http://www.rudi.net/pages/8755>

MENSTRUKTURKAN PERSOALAN DESAIN

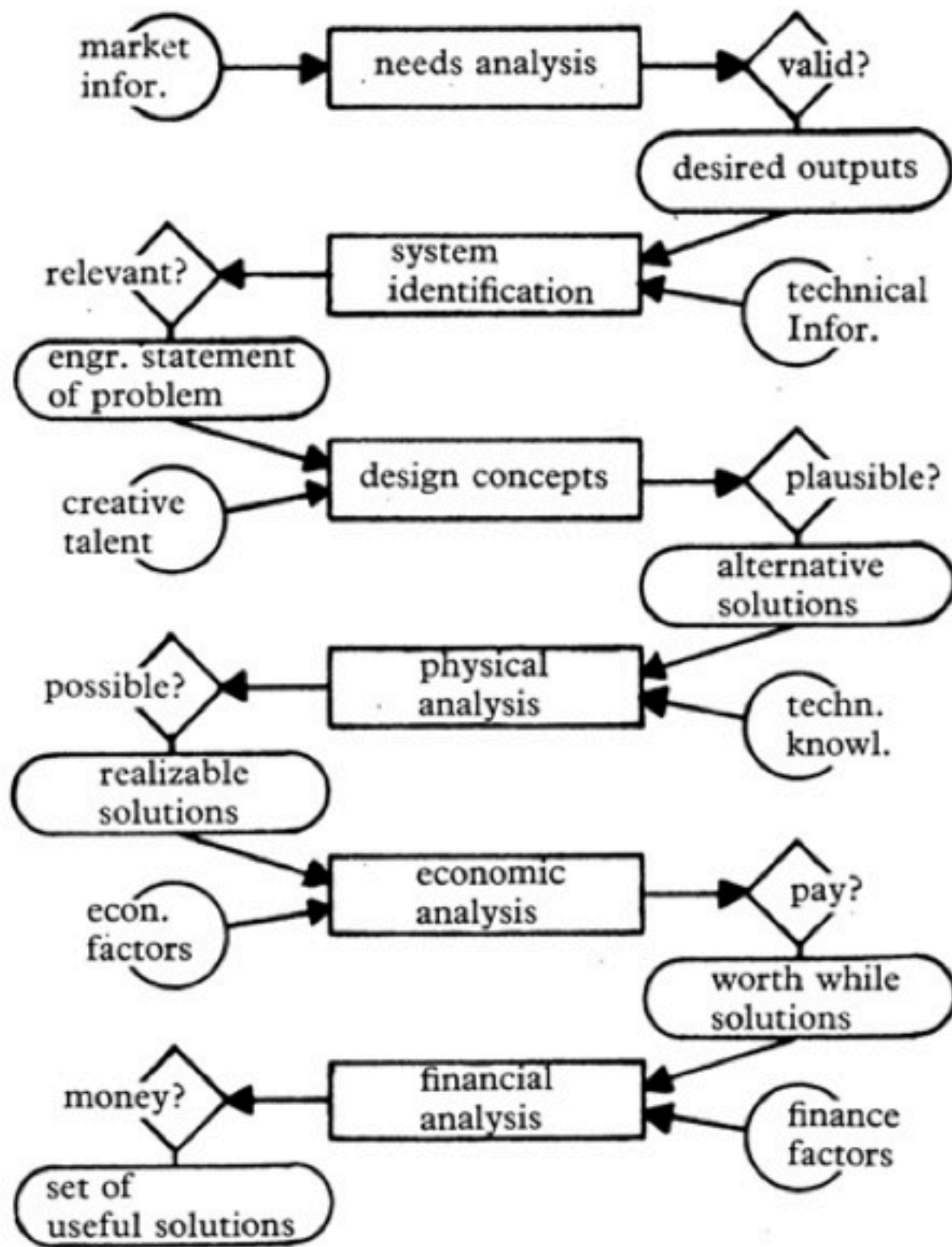
Christopher Alexander (1977) *A Pattern Language: Towns, Buildings, Construction*. Oxford University Press

A pattern is a careful description of a perennial solution to a recurring problem within a building context, describing one of the configurations which brings life to a building.

Each pattern describes a problem which occurs over and over again in our environment, and then describes the core solution to that problem, in such a way that you can use the solution a million times over, without ever doing it the same way twice.

<http://www.rudi.net/pages/8755>

MENSTRUKTURKAN PERSOALAN DESAIN



> **Mengurutkan** menjadi bagian-bagian yang dapat dikelompokkan dalam tahapan

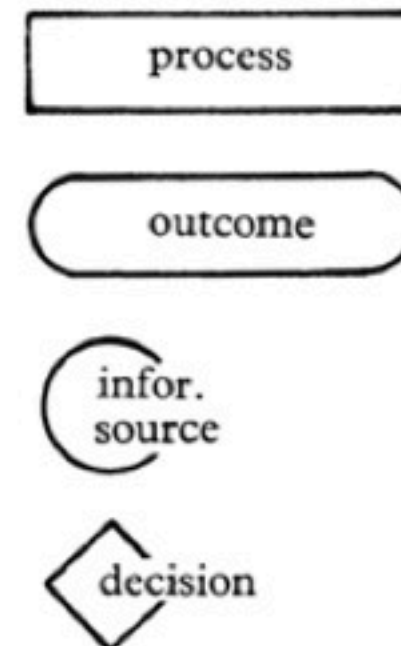
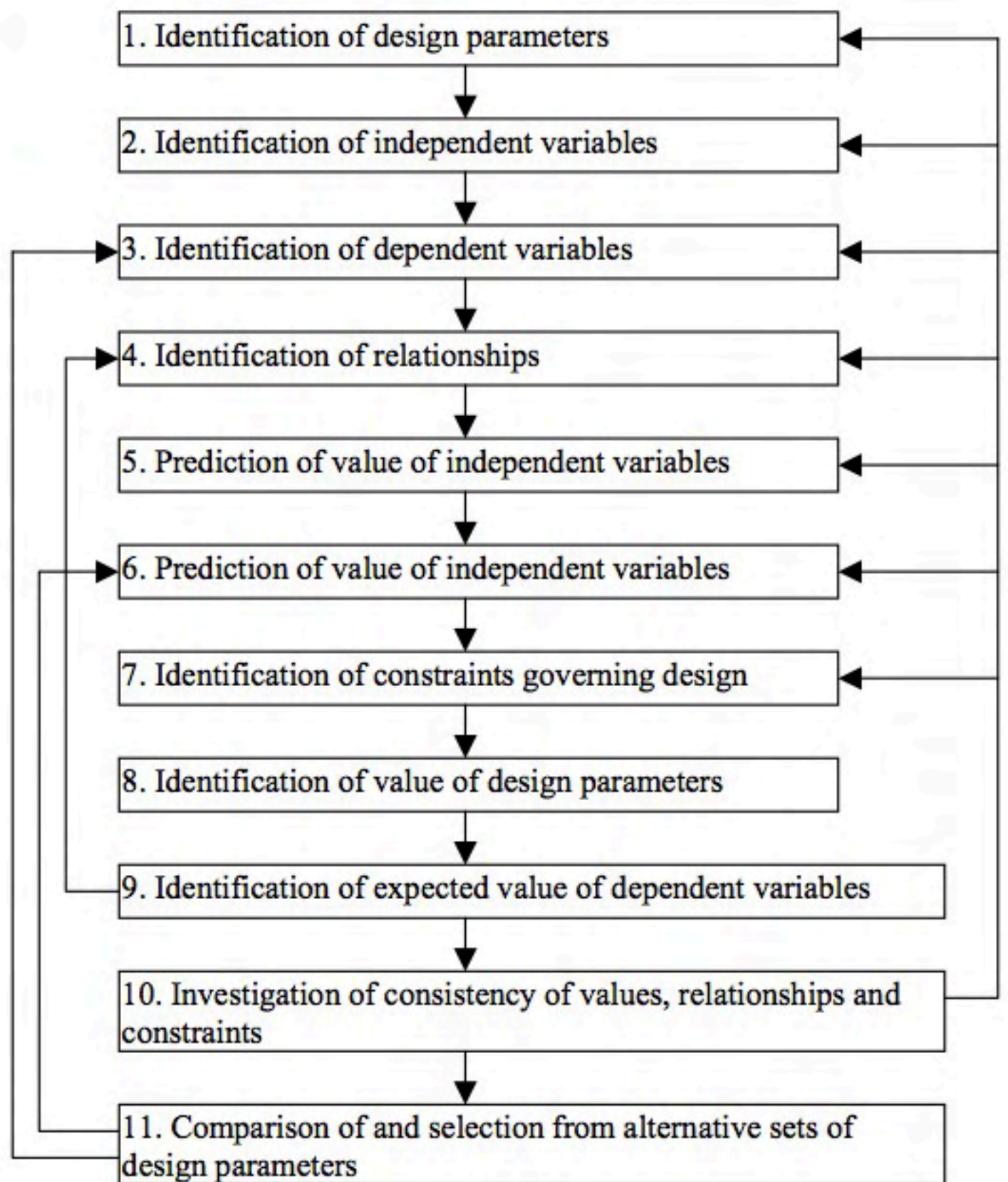


Diagram for a preliminary design (Asimow, 1962)

MENSTRUKTURKAN PERSOALAN DESAIN



> **Mengurutkan** menjadi bagian-bagian yang dapat dikelompokkan dalam tahapan dilengkapi dengan proses iteratif

Eleven stages in the decision sequence (Markus, 1969)

There are two distinct design structures: **a sequential process** and **an iterative process.**

MENSTRUKTURKAN PERSOALAN DESAIN

> **menyusun dalam matriks** yang memberikan penekanan pada kesamaan bobot antar sel / permasalahan dan pengkategorian yang ketat.

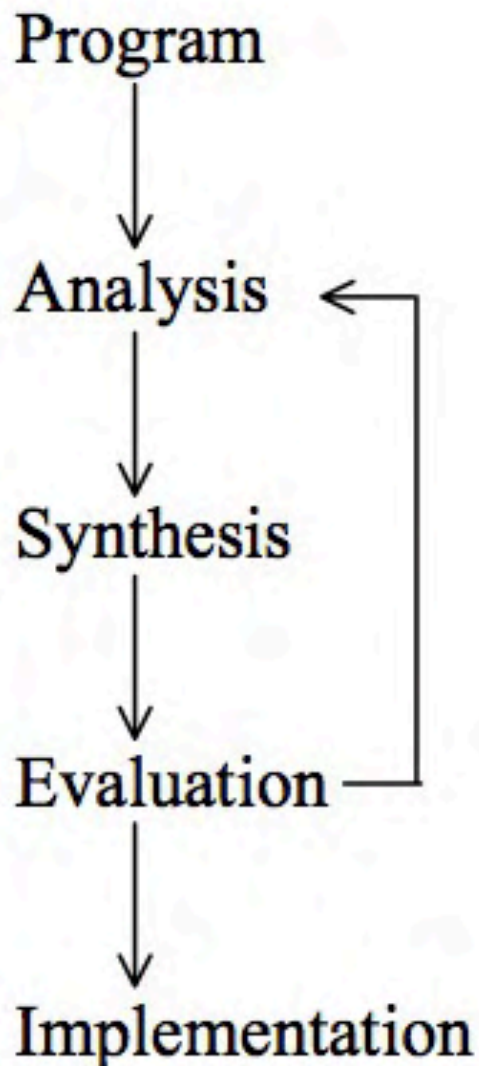
Values	(a) Existing Site Characteristics	(b) Future Site Uses	(c) Goals and Objectives
1. Environment	<ul style="list-style-type: none"> ⇒ Brownfields/Contamination ⇒ Unused industrial buildings, site, equipment ⇒ End of Federal shipping channel ⇒ Combined sewer outlets across river. ⇒ Runoff from hard surfaces. ⇒ Wasted energy from working mill. 	<ul style="list-style-type: none"> ⇒ Phytoremediation projects. ⇒ Riverbank/riparian corridor restoration. ⇒ Shipping channel improvements. ⇒ Green Building Technologies on new structures. ⇒ Green renovation of existing structures. ⇒ Demonstration site for environmental technologies. 	<ul style="list-style-type: none"> ⇒ Sustained/permanent remediation. ⇒ Habitat Restoration ⇒ Clean surface runoff/utilization of clean roof runoff. ⇒ Making techniques visible. ⇒ Use of wasted energy resources.
2. Human Comfort	<ul style="list-style-type: none"> ⇒ Low access from surroundings. ⇒ Desolate, intimidating. ⇒ No facilities. 	<ul style="list-style-type: none"> ⇒ Industrial play/exploration areas. ⇒ Outdoor areas. ⇒ Public Facilities. 	<ul style="list-style-type: none"> ⇒ Make accessible to cars, boats, [commercial and private], alternative transportation. ⇒ Make inviting-human scale, easy navigation. ⇒ Facilities for rest, comfort, recreation, entertainment, and learning.
3. Culture and Tradition	<ul style="list-style-type: none"> ⇒ Economic importance of steel mills to City. ⇒ Generator of surrounding neighborhoods ⇒ Current economic and cultural impacts ⇒ City identity ⇒ Historical/Nostalgic values, Collective memories. ⇒ Devastating impacts of mill closings [past and present] 	<ul style="list-style-type: none"> ⇒ Historical/Interpretive Center. ⇒ Tours/Restorations of Industrial Artifacts. ⇒ Rest/Camping areas for potential Towpath extension users. ⇒ Environmental center. ⇒ Educational facilities. 	<ul style="list-style-type: none"> ⇒ Transmission of cultural/collective memory. ⇒ Create showcase for environmental technologies. [greening of industry] ⇒ Education resources for local schools.

Cari rujukan pematrian penstruktural masalah dari referensi lain!

MENSTRUKTURKAN PERSOALAN DESAIN

> **Menberi dugaan, terkaan, tebakan - conjecture** yang dilengkapi dengan proses pengujian terkaan tersebut

Traditional Shape



Popperian Shape

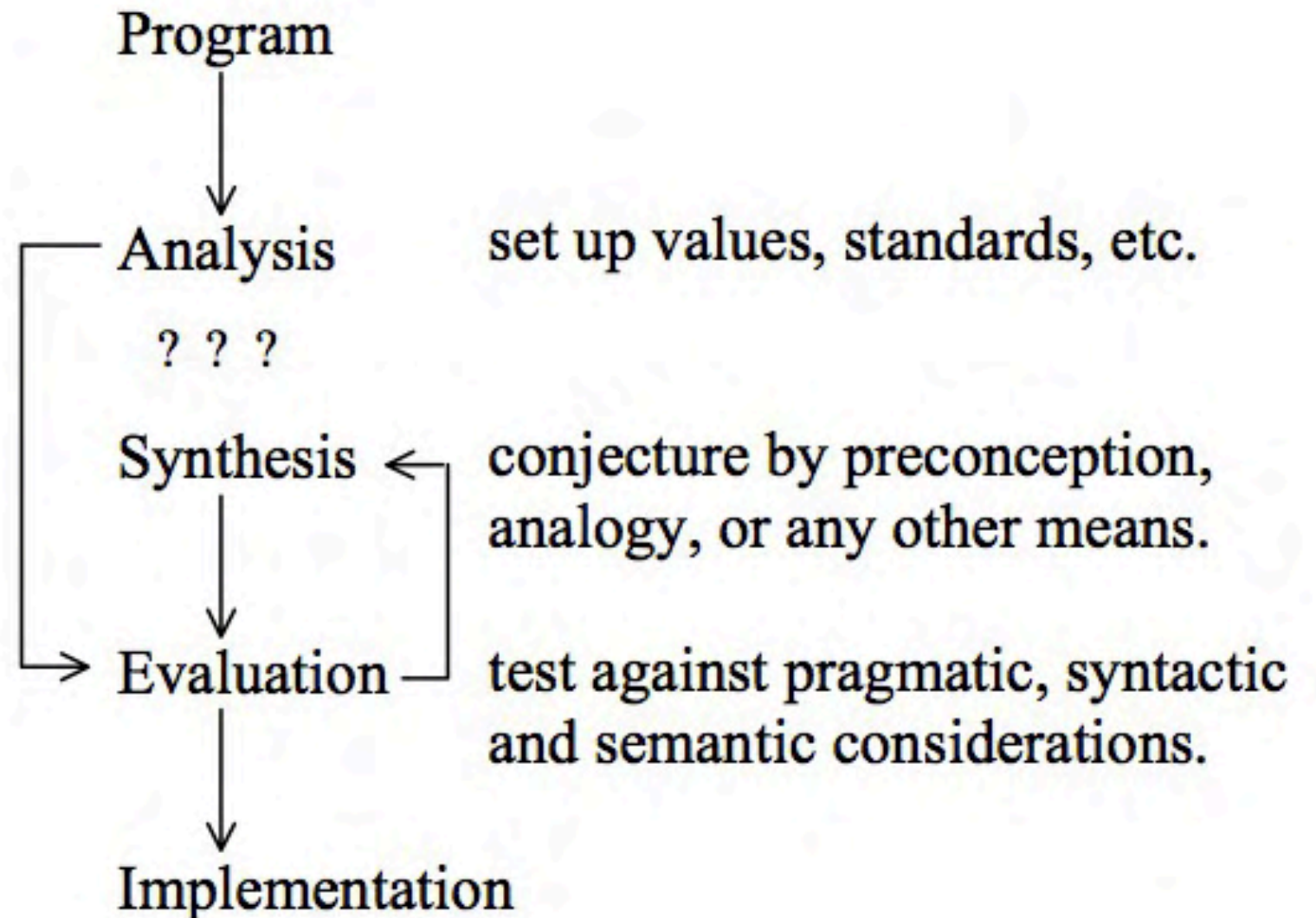
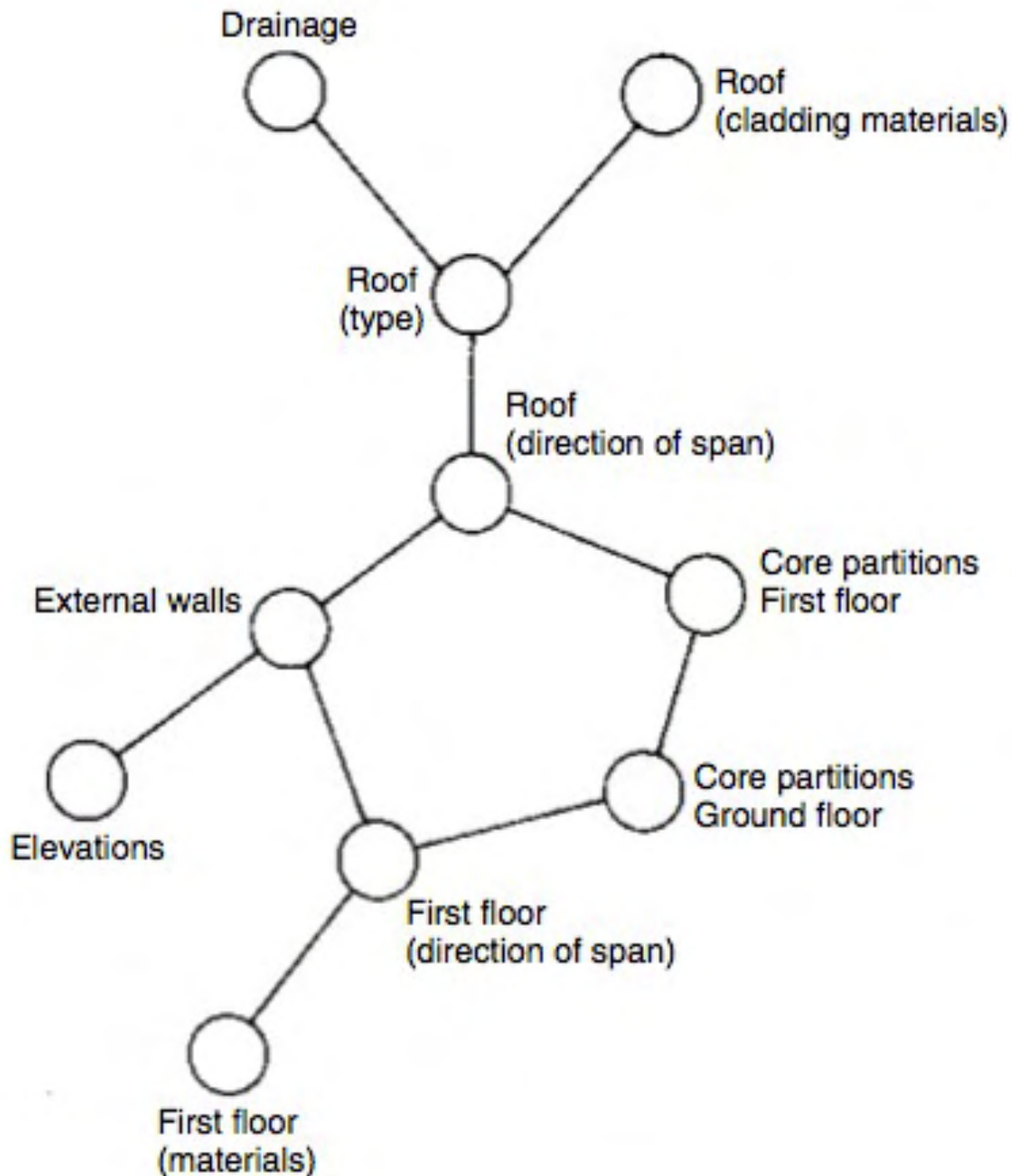


Diagram adapted from Broadbent (Wang, 2002)

MENSTRUKTURKAN PERSOALAN DESAIN

> **Membuat ‘decision tree’** atau pohon pengambilan keputusan untuk menstrukturkan

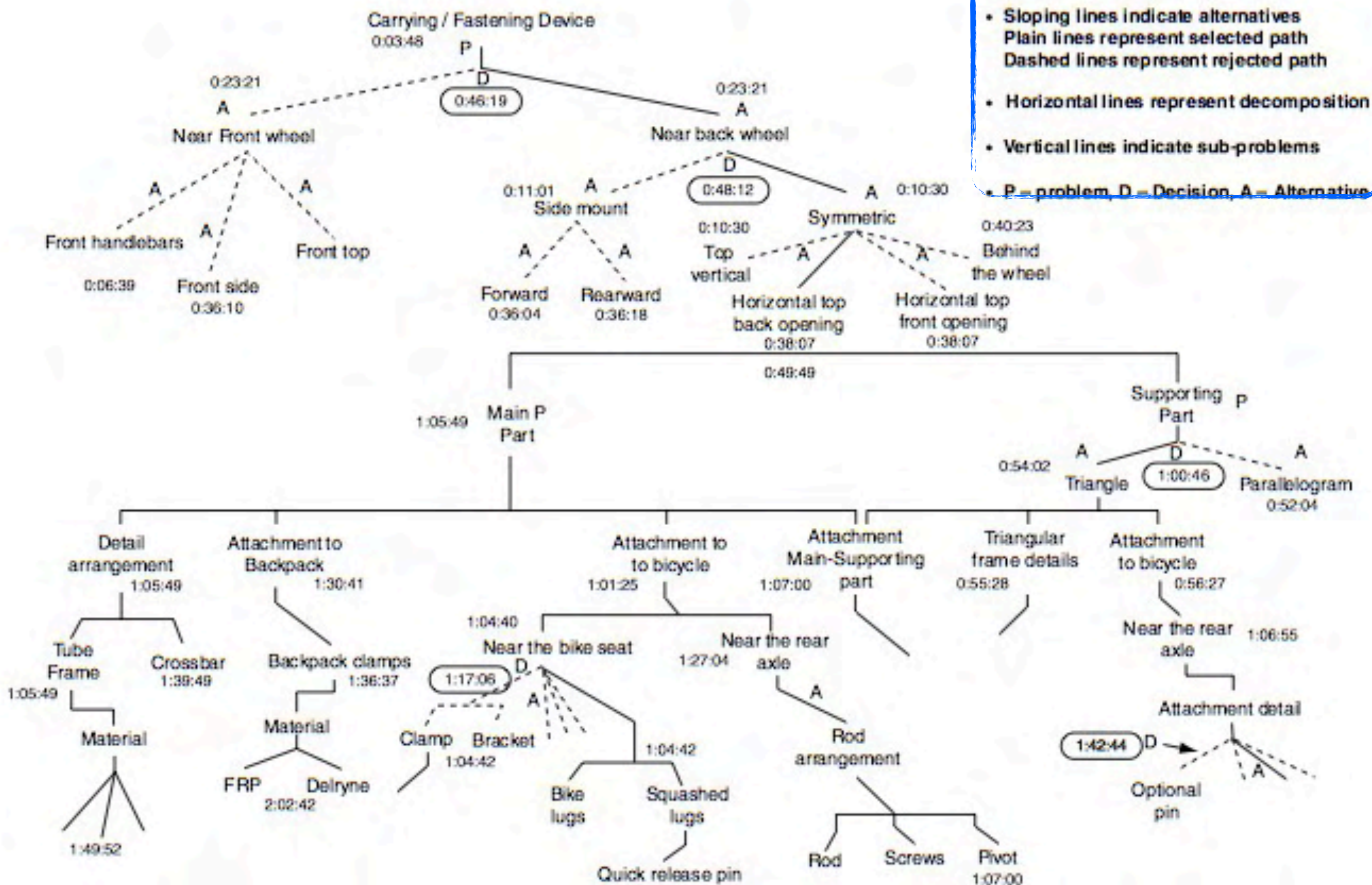
Kadang kita menemui struktur masalah yang sirkular (saling mempengaruhi): studi struktur masalah perumahan



Nigel Cross (2008) Engineering Design Methods, John Wiley&Sons, 4th edition hal. 15

Struktur pengambilan keputusan yang lebih membantu!

Nigel Cross (2008) Engineering Design Methods, John Wiley&Sons, 4th edition hal. 17



DISAIN / RISET SEBAGAI PENYELESAIAN PERSOALAN DESAIN

DESIGN/RESEARCH AS PROBLEM SOLVING

Architectural research covers **many different fields**. It includes material and environmental science, study of the occupation and use of buildings, management, architectural history and theory, and design. Each of these fields is approached through separate disciplinary traditions ... It is therefore not possible to say that architectural research is a discipline in its own right. It incorporates many disciplines.

The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, *Evaluation of Swedish Architectural Research 1995*
- 2005, Stockholm, 2006.

Christopher Frayling, 1993 'Research into Art and Design'

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PARADIGMA DISAIN DAN KAITANNYA DENGAN MASALAH DISAIN

design as
rational problem solving

problem decomposition

design as search, solving (sub) problems

integrating partial solutions to whole
solutions

quantifiable methods are preferred
compared to qualitative methods. a
sound theoretical background, but does
not sound familiar to an
architect;

see Dorst 1997 diambil dari Henri Achten, Design methods and design theory for architectural design
management, ADMS selected work 2003-2007.

design as reflective practice

architect continuously
decomposes the problem but each time
different as the need occurs (naming)

sets up a (sub)-design problem (framing)

creates a partial solution (moving) checks
whether the result is moving in the right
direction (evaluating).

weak theoretical background, but sounds
much more true to an architect

POSISI DISAIN-PENELITIAN DAN KAITANNYA DENGAN MASALAH

Design Method

Context of Design

Analysis & Synthesis

Identify insight, generate idea

Solve design questions

Designers, users

Groat & Wang, 2002

Research Method

General

Qualitative & Quantitative

Validation -proofing knowledge

Answer research questions

Researchers, subjects

both scientific methods?

VARIASI METODA DISAIN

Desain sebagai analisis dan evaluasi

Programming: usaha yang dilakukan untuk memperbanyak informasi sehingga muncul konsep figuratif yang merespon pada sebanyak mungkin kriteria.

POE: usaha untuk mereduksi “black hole” dengan mengevaluasi hasil sebuah perancangan

> bagian awal dan akhir jelas, bagian tengah yaitu perancangan itu sendiri tetap tidak jelas

Desain sebagai penelitian aksi

Kajian yang mempelajari situasi yang konkrit terutama pada faktor-faktor logis yang berhubungan satu dengan yang lain dalam situasi itu yang menuju pada satu tujuan empirik tertentu melalui proses siklikal: *diagnosing, action planning, action taking, evaluating, specifying*

> bagian perancangan lebih terungkap dengan proses yang iteratif

Desain sebagai ketrampilan yang dipelajari

Desain sebagai sebuah usaha belajar dari pengalaman praktik (bukan spekulatif).

Brian Lawson: **generator** (pihak yang memotivasi perancangan) - **function** (simbolis, formal, praktikal, radikal) dan **domain** (internal, eksternal). Jane

Darke: **generator - conjecture - analysis**. Desain sebagai proses yang mengintegrasikan “cluster of requirements” menjadi solusi yang *integrated*.

> bagian perancangan terungkap melalui proses yang dipraktikkan

Desain sebagai langkah kolaborasi

Arsitek sebagai kultivator, bukan sebagai teknisi murni ataupun seniman murni tetapi lebih sebagai pihak yang sensitif terhadap ‘misi dari komunitas’

> bagian perancangan adalah proses kolaboratif dan partisipatif.

Groat & Wang, 2002

RANAH METODA DISAIN

Analysis Method

Method of data decomposition
i.e., Task analysis, Cluster analysis

Method of interpretation
i.e., Semantic differential,
Product semantic

Method of system analysis
i.e., Technical transformation system

Method of object classification
i.e., Object oriented analysis

Synthesis Method

Method of idea generation
i.e., Mind mapping

Method of decision making
i.e., Design Rational

Method of co-design
i.e., Scenario Based Design,
Participatory Design

Method of reusing design knowledge
i.e., Pattern Language

Method of realizing design
i.e., Prototyping and Simulation

Groat & Wang, 2002

VARIASI METODA DISAIN/RISET

Disain dan Penelitian Sejarah

Disain dan Penelitian Kualitatif

Disain dan Penelitian Eksperimental

Disain dan Penelitian Korelasional

Disain dan Argumentasi Logis

Studi Kasus dan Pendekatan Nekametoda
dalam Penelitian

Groat & Wang, 2002